

Applicant(s): Jong-hyon Ahn
U.S. Serial No.: 09/879,556

in the ILD film which are formed to define two cross-sectional portions of the trench, a lower portion of the trench having sidewalls which define a first cross-sectional width of the trench and an upper portion of the trench having sidewalls which define a second cross-sectional width of the trench, the first cross-sectional width of the lower portion of the trench being wider than the second cross-sectional width of the upper portion of the trench;

a conductive layer forming a conductive line in the trench, the conductive line having, in cross-section, a first upper portion and a second lower portion under the first upper portion, the second lower portion being wider than the first upper portion.

2. (Twice Amended) The metal interconnect structure of claim 1, wherein the metal interconnect layer comprises:

a barrier layer deposited along the bottom and side surfaces of the trench; and
wherein

the conductive layer is deposited over the barrier layer filling the trench.

3. (Amended) The metal interconnect structure of claim 2, wherein the ILD film is formed of a single insulation layer with a material layer selected from the group consisting of undoped silicate glass (USG) layer, silicon oxide fluoride (SiOF) layer, tetraethylorthosilicate (TEOS) layer, spin-on glass (SOG) layer and borophosphosilicate glass (BPSG).

4. (Amended) The metal interconnect structure of claim 3, wherein the thickness of an upper portion of the ILD film abutting a portion of the trench with the upper width is in the range of 20-70% of the thickness of the entire ILD film.

8. (Amended) The metal interconnect structure of claim 2, wherein the barrier layer is formed of one of a Ta layer, TaN layer, Ti layer, TiN layer, and a bilayer of these material layers.

Applicant(s): Jong-hyon Ahn
U.S. Serial No.: 09/879,556

9. (Amended) The metal interconnect structure of claim 2, wherein the conductive layer is formed of one of a Cu and a W layer.
